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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/805,039	03/19/2004	Kenneth Allen Poppleton	144021	7963

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EXAMINER
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SUCHECKI, KRYSZYNA

ART UNIT	PAPER NUMBER
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2882

DATE MAILED: 02/22/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

EJL

<b>Office Action Summary</b>	<b>Application No.</b> 10/805,039	<b>Applicant(s)</b> POPPLETON, KENNETH ALLEN	
	<b>Examiner</b> Krystyna Suchecki	<b>Art Unit</b> 2882	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 20 January 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

Claims 1-3, 5-10, 12 and 14-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koch in view of Amitani (US 6,476,394).

Regarding Claims 1 and 14, Koch teaches a method for calibrating an X-ray imaging system and determining distortion in an X-ray imaging system, said method comprising: configuring an output of a calibration image source (Figure 3) in a pattern (provided by grating, 23) to define a calibration image: generating a calibration image light pattern within an X-ray imaging system (image intensifier) using the calibration image source; and determining an image distortion of the X-ray imaging system based upon the calibration image for calibrating the X-ray imaging system (Figure 1 and Column 4, lines 43-57). The image distortion is determined during a calibration phase (*Id.*)

Koch does not teach that the determining of an image distortion is based upon a plurality of samplings of a calibration image or that a generated calibration image is subject to interpolation before comparison with a pattern output of the calibration image source.

Amitani teaches the calibration of an image capturing apparatus where a plurality of calibration images are captured to assist with the correction and determination of image distortion in order to make a correction of images more precisely and to easily raise the resolution of an image (Column 18, lines 35-44). When a magnitude of a signal value is low, a calibration pattern is interpolated in order to obtain a correct image of an

Art Unit: 2882

object (Column 21, lines 14-23). In this way, Amitani shows that the expected pattern of a calibration source is compared to a low value signal, and the image off of the imager is interpolated by comparison to the expected (Particulars of Figures 5-11 at Columns 20 and 21).

Therefor, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the plurality of images of Amitani in the method of Koch in order to compliment the calibration phase of Koch to precisely correct image distortion and easily raise the resolution of an image (Amitani, Column 18, lines 35-44). Interpolation of the pattern of Koch as taught by Amitani would have been obvious to one of ordinary skill in the art at the time the invention was made in order to respond to low signal values yet still obtain a correct image of an object (Amitani, Column 21, lines 14-23). Koch could achieve this goal comparing the expected pattern to an interpolated pattern from an image on the image intensifier.

Regarding claim 2, Koch teaches a method in accordance with claim 1 further comprising calibrating the X-ray imaging system using the calibration image (Column 4, lines 43-57).

Regarding Claim 3, Koch teaches a method in accordance with claim 2 wherein the calibrating is performed after one of determining a change in an external source causing distortion and moving the X-ray imaging system (Column 1, lines 48-62 and Column 4, lines 3-7).

Regarding Claims 5, 10 and 12, Koch teaches a method in accordance with claim 1 further comprising measuring an output image generated based upon the calibration image to determine the image distortion or comprising comparing the calibration image to an output image to determine and compensate for the image distortion (Column 1, lines 35-47 and Column 4, lines 43-65).

Regarding Claims 6-9, Koch teaches a method in accordance with claim 1 wherein the calibration image comprises a pattern comprising one of a grid, a plurality of dots and a pattern of shapes by generating a light pattern, which is a non-x-ray pattern (Column 3, lines 51-67).

Regarding Claim 15, Koch teaches a method in accordance with claim 14 further comprising compensating for the distortion (Column 1, lines 35-47 and Column 4, lines 43-65).

Regarding Claim 16, Koch teaches a method in accordance with claim 14 wherein the light pattern comprises one of a measurable and identifiable pattern (Column 3, lines 51-67).

Regarding Claim 17, Koch teaches a method in accordance with claim 14 wherein the image intensifier comprises a calibration image source having at least one laser light source for generating the light pattern (Column 3, lines 40-50).

Regarding Claim 18, Koch teaches a method in accordance with claim 17 wherein the laser light source comprises a grating (23) for creating the light pattern.

Claims 4, 13 and 19-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koch and Amitani and further in view of Quadflieg (US 6,086,252).

Regarding Claims 4, 13, 19 and 21, Koch and Amitani teach an image intensifier method with a plurality of samplings of a correction image as above for claims 1 and 14, and thereby teaches a system for determining distortion within an X-ray imaging device.

Koch and Amitani fail to teach the generating as performed within the image intensifier by a calibration image source within an image intensifier for generating the calibration image within the image intensifier, the calibration image source positioned within the image intensifier generally at an end of the image intensifier that is closer to an output window than to an input window.

Quadflieg teaches light sources positioned within the image intensifier generally at an end of the image intensifier that is closer to an output window than to an input window (4) for noise correction in an image intensifier (Figure 1). An obvious benefit of containing the light sources within the image intensifier is that the light sources cannot be bumped or smashed while moving the image intensifier, since they are contained inside and thereby protected.

Therefor, it would have been obvious to one of ordinary skill in the art at the time the invention was made to house the calibration image source of Koch and Amitani within the image intensifier housing as taught by Quadflieg since the containment of the image source within the image intensifier would offer protection from bumping and smashing while moving the image intensifier.

Regarding Claim 20, Koch teaches a system in accordance with claim 19 wherein the calibration image comprises a pattern (Column 3, lines 51-67).

Regarding Claim 22, Koch teaches a system in accordance with claim 19 wherein the X-ray imaging system comprises a mobile X-ray imaging system (Column 1, lines 48-62 and Column 4, lines 2-7).

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Koch and Amitani and further in view of Pradere.

Regarding Claim 11, Koch and Amitani teach image distortion correction for a mobile X-ray imaging system as above for claims 1, 3 and 10.

Koch and Amitani fail to teach calibration as performed in connection with a mobile X-ray imaging system to compensate for changes in non-uniform magnetic fields

Pradere teaches calibration is performed in image intensifier systems in connection with a mobile X-ray imaging system to compensate for changes in non-uniform magnetic fields (Column 3, lines 1-14, and via motion between magnetic isolation and patient testing areas, Column 6, line 66- Column 7, line 34). Such calibration addresses deleterious S deformation (Column 1, lines 50-65).

Therefor, it would have been obvious to one of ordinary skill in the art at the time the invention was made to compensate for changes in non-uniform magnetic fields in the method of Koch and Amitani as taught by Pradere in order to address deleterious S deformation (Pradere, Column 1, lines 50-65).

***Response to Arguments***


Applicant's arguments with respect to claims 1-22 have been considered but are moot in view of the new ground(s) of rejection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Krystyna Suchecki whose telephone number is (571) 272-2495. The examiner can normally be reached on M-F, 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Glick can be reached on (571) 272-2490. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
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**EDWARD J. GLICK**  
**SUPERVISORY PATENT EXAMINER**